General

Guideline Title

Clinical practice guideline: improving nasal form and function after rhinoplasty.

Bibliographic Source(s)

Ishii LE, Tollefson TT, Basura GJ, Rosenfeld RM, Abramson PJ, Chaiet SR, Davis KS, Doghramji K, Farrior EH, Finestone SA, Ishman SL, Murphy RX Jr, Park JG, Setzen M, Strike DJ, Walsh SA, Warner JP, Nnacheta LC. Clinical practice guideline: improving nasal form and function after rhinoplasty. Otolaryngol Head Neck Surg. 2017 Feb;156(2 Suppl):S1-S30. [125 references] PubMed

Guideline Status

This is the current release of the guideline.

This guideline meets NGC's 2013 (revised) inclusion criteria.

Recommendations

Major Recommendations

The evidence grades (A-D, X) and evidence-based statements (Strong Recommendation, Recommendation, and Option) are defined at the end of the "Major Recommendations" field.

Statement 1: Communicating Expectations

Clinicians should ask all patients seeking rhinoplasty about their motivations for surgery and their expectations for outcomes, should provide feedback on whether those expectations are a realistic goal of surgery, and should document this discussion in the medical record.

Recommendation based on observational studies, with a preponderance of benefit over harm.

Action Statement Profile

- Quality improvement opportunity: Avoid poor surgical outcomes among patients with unrealistic expectations (National Quality Strategy [NQS] domains: patient safety; patient and family engagement)
- Aggregate evidence quality: Grade C, based on observational studies with a preponderance of benefit over harm
- Level of confidence in evidence: Low because of limited evidence
- Benefits: Promote realistic expectations of achievable surgical outcomes, avoid surgery among patients with unrealistic expectations, better align clinician and patient expectations, promote enhanced communication, identify underlying psychiatric disorders (e.g., body dysmorphic disorder, or BDD), promote patient satisfaction
- Risk, harm, cost: Patient anxiety, time spent in assessing and counseling the patient

- Benefit-harm assessment: Preponderance of benefit over harm
- Value judgments: Perception by the guideline development group (GDG) that expectations are not always fully considered before rhinoplasty and that explicitly assessing expectations could help improve outcomes and potentially avoid surgery among patients with unachievable goals
- Intentional vagueness: The specifics of the discussion are left to the discretion of the patient and clinician
- Role of patient preferences: None
- Exceptions: None
- Policy level: Recommendation
- Differences of opinion: None

Statement 2: Comorbid Conditions

Clinicians should assess rhinoplasty candidates for comorbid conditions that could modify or contraindicate surgery, including obstructive sleep apnea (OSA), BDD, bleeding disorders, or chronic use of topical vasoconstrictive intranasal drugs.

Recommendation based on observational studies, with a preponderance of benefit over harm.

Action Statement Profile

- Quality improvement opportunity: Identify known and potentially unknown comorbid conditions that could result in poor outcomes or complications if not detected prior to surgery (NQS domain: patient safety)
- Aggregate evidence quality: Grade C, based on observational studies with a preponderance of benefit over harm
- Level of confidence in evidence: High
- Benefits: Reduce surgical complications, identify opportunities to optimally prepare patients for surgery, better counsel patients regarding surgical risk, avoid surgery in poor candidates
- Risk, harm, cost: Time spent in assessing for comorbid conditions, false-positive results from screening surveys, making the patient self-conscious
- Benefit-harm assessment: Preponderance of benefit over harm
- Value judgments: None
- Intentional vagueness: None
- Role of patient preferences: None
- Exceptions: None
- Policy level: Recommendation
- Differences of opinion: None

Statement 3: Nasal Airway Obstruction

The surgeon, or the surgeon's designee, should evaluate the rhinoplasty candidate for nasal airway obstruction during the preoperative assessment.

Recommendation based on observational studies, with a preponderance of benefit over harm.

Action Statement Profile

- Quality improvement opportunity: Call explicit attention to an aspect of rhinoplasty planning that could be overlooked, and identify unrelated causes of nasal airway obstruction (NQS domain: clinical process/effectiveness)
- Aggregate evidence quality: Grade C, based on observational studies with a preponderance of benefit over harm
- Level of confidence in evidence: High
- Benefits: Avoid overlooking nasal airway obstruction; refine the surgical plan; identify deviated nasal septum, nasal valve collapse, or both; identify nonanatomic causes of obstruction, including inflammatory disorders, neoplastic disorders, and obstructing adenoids
- Risk, harm, cost: Cost and adverse events of diagnostic procedures (endoscopy, imaging), time spent in evaluating the patient, potential for focusing attention on incidental or asymptomatic findings
- Benefit-harm assessment: Preponderance of benefit over harm
- Value judgments: Perception by a majority of the GDG that early evaluation for nasal airway obstruction could identify opportunities to surgically improve the airway during rhinoplasty, which may have been overlooked if not explicitly assessed prior to surgery
- Intentional vagueness: The method of evaluating for nasal airway obstruction is left to the discretion of the clinician
- Role of patient preferences: Limited, primarily concerns the choice of tests or procedures beyond the basic physical examination
- Exceptions: None
- Policy level: Recommendation

- Differences of opinion: Minor differences regarding the inclusion of nasal function versus nasal obstruction in the key action statement resulted in a panel vote: 8 members of the GDG voted to include nasal obstruction; 3 voted to include nasal function; and 1 did not have an opinion

Statement 4: Preoperative Education

The surgeon, or the surgeon's designee, should educate rhinoplasty candidates regarding what to expect after surgery, how surgery might affect the ability to breathe through the nose, potential complications of surgery, and the possible need for future nasal surgery.

Recommendation based on observational studies on the benefits, in general, of the value of education and counseling, with a preponderance of benefit over harm.

Action Statement Profile

- Quality improvement opportunity: To facilitate shared decision making regarding the need for surgery and surgical outcomes (NQS domain: patient and family engagement)
- Aggregate evidence quality: Grade C, based on observational studies on the benefits, in general, of the value of education and counseling, with a preponderance of benefit over harm
- Level of confidence in evidence: High
- Benefits: Facilitate shared decision making, promote realistic expectations, promote informed consent, identify unrealistic expectations, improve quality of care and outcomes
- Risk, harm, cost: Time spent with education, patient anxiety
- Benefit-harm assessment: Preponderance of benefit over harm
- Value judgments: None
- Intentional vagueness: None
- Role of patient preferences: None
- Exceptions: None
- Policy level: Recommendation
- Differences of opinion: None

Statement 5: Counseling for OSA Patients

The clinician, or the clinician's designee, should counsel rhinoplasty candidates with documented OSA about the impact of surgery on nasal airway obstruction and how OSA might affect perioperative management.

Recommendation based on systematic reviews or randomized and observational studies with preponderance of benefit over harm.

Action Statement Profile

- Quality improvement opportunity: To facilitate informed patient decisions and coordinate care for optimal surgical outcomes (NQS domains: patient safety; care coordination)
- Aggregate evidence quality: Grade B, systematic reviews or randomized and observational studies regarding the positive impact of rhinoplasty on OSA (reduced continuous positive airway pressure [CPAP] pressures, enhanced CPAP compliance, lower apnea hypopnea index); Grade C, observational studies on the benefits, in general, of counseling on shared decision making
- Level of confidence in evidence: High
- Benefits: Increase awareness of beneficial effects of rhinoplasty on CPAP compliance and use, increase awareness of rhinoplasty as a means to reduce severity of OSA, facilitate shared decision making, facilitate coordination of care (primary care clinician, sleep medicine specialist, anesthesiologist, surgeon), plan more effectively for perioperative management
- Risk, harm, cost: Time spent counseling, increased patient anxiety
- Benefit-harm assessment: Preponderance of benefit over harm
- Value judgments: None
- Intentional vagueness: None
- Role of patient preferences: None
- Exceptions: None
- Policy level: Recommendation
- Differences of opinion: Minor regarding the need to include a separate statement about counseling for rhinoplasty candidates with OSA: 8 members of the GDG voted in favor of a statement; 5 members felt that an additional statement was unnecessary

Statement 6: Managing Pain and Discomfort

The surgeon, or the surgeon's designee, should educate rhinoplasty patients before surgery about strategies to manage discomfort after surgery.

Recommendation based on studies of the value of education and counseling, with a preponderance of benefit over harm.

Action Statement Profile

- Quality improvement opportunity: To facilitate informed patient decisions and coordinate care for optimal management of pain and discomfort (NQS domains: patient and family engagement; clinical process/effectiveness)
- Aggregate evidence quality: Grade C, observational studies on the benefits, in general, of the value of education and counseling, with a preponderance of benefit over harm
- Level of confidence in evidence: Medium because of the indirectness of evidence and need to extrapolate from other pain management studies
- Benefits: Establish expectations regarding pain and discomfort, increase patient satisfaction, decrease need for postoperative calls to physician office, raise awareness of intraoperative and postoperative strategies to reduce pain and discomfort, reduce patient anxiety
- Risk, harm, cost: Time spent counseling
- Benefit-harm assessment: Preponderance of benefit over harm
- Value judgments: Importance of patient education in promoting optimal outcomes
- Intentional vagueness: None
- Role of patient preferences: None
- Exceptions: None
- Policy level: Recommendation
- Differences of opinion: None

Statement 7: Postoperative Antibiotics

When a surgeon, or surgeon's designee, chooses to administer perioperative antibiotics for rhinoplasty, he or she should *not* routinely prescribe antibiotic therapy for a duration >24 hours after surgery.

Recommendation against prescribing based on randomized controlled trials and systematic reviews, with a preponderance of harm over benefit.

Action Statement Profile

- Quality improvement opportunity: Reduce antibiotic prescribing after rhinoplasty and promote antibiotic stewardship (NQS domain: patient safety)
- Aggregate evidence quality: Grade B, randomized controlled trials and systematic reviews with a preponderance of harm over benefit
- Level of confidence in evidence: Medium based on indirectness of evidence about benefits beyond 24 hours and absence of evidence concerning benefits of antibiotic prophylaxis for rhinoplasty patients
- Benefits: Promote selective use of antibiotics after surgery (reducing induced bacterial resistance), reduce antibiotic adverse effects, reduce cost
- Risk, harm, cost: Potential for infection among patients who might have benefited from >24 hours of antibiotic therapy but did not receive it
- Benefit-harm assessment: Preponderance of benefit over harm
- Value judgments: Perception by the GDG that antibiotics are commonly prescribed after rhinoplasty despite a lack of evidence to consistently support benefits of administering antibiotics beyond a single intraoperative dose or >24 hours after surgery; a desire to avoid reflex, or automatic, prescribing of antibiotics after 24 hours
- Intentional vagueness: The word "routine" is used to avoid setting a legal standard of care and to reflect that there may be individual patient situations that warrant antibiotic prescribing
- Role of patient preferences: Small
- Exceptions: Revision surgery, complicated rhinoplasty, patients receiving nasal implants, patients with postoperative nasal packing, patients with baseline nasal colonization with MRSA (methicillin-resistant *Staphylococcus aureus*), extensive cartilage grafting, immunocompromised patients, concurrent medical condition requiring antibiotics (e.g., rhinosinusitis)
- Policy level: Recommendation against
- Differences of opinion: None

Statement 8: Perioperative Steroids

The surgeon, or the surgeon's designee, may administer perioperative systemic steroids to the rhinoplasty patient.

Option based on systematic review of randomized controlled trials with limitations and a balance of benefits and harms.

Action Statement Profile

- Quality improvement opportunity: Promote awareness of the benefits and risks of systemic steroids; engage patients in shared decisions; emphasize a need for future research to increase our confidence in the effect of perioperative steroids on the rhinoplasty patient (NQS domains: patient safety; clinical process/ effectiveness)
- Aggregate evidence quality: Grade B, based on systematic review of randomized controlled trials with limitations and a balance of benefits and harms
- Level of confidence in evidence: Low, because of small randomized trials with heterogeneity in drug dosing, administration, and assessment of clinical outcomes; low precision in systematic review pooled estimates of treatment effect
- Benefits: Reduced periorbital ecchymosis and edema, reduced discomfort, less postoperative nausea and vomiting
- Risk, harm, cost: Cost, adverse events of systemic steroids (which include bone weakening, avascular necrosis of the femur, adverse effect on diabetes, nervousness/ anxiety, etc.), potential impact on wound healing
- Benefit-harm assessment: Balance of benefits and harms
- Value judgments: None
- Intentional vagueness: The specifics of dosing and timing of steroid administration are at the discretion of the clinician
- Role of patient preferences: Moderate role in deciding whether or not to receive steroids
- Exceptions: Patients for whom systemic steroids are contraindicated
- Policy level: Option
- Differences of opinion: None

Statement 9: Nasal Packing

Surgeons should *not* routinely place packing in the nasal cavity of rhinoplasty patients (with or without septoplasty) at the conclusion of surgery.

Recommendation against, based on systematic reviews and randomized controlled trials with a preponderance of harm over benefit and a lack of studies regarding the benefits of nasal packing after rhinoplasty.

Action Statement Profile

- Quality improvement opportunity: Improve patient comfort and outcomes by avoiding routine nasal packing in the absence of documented benefits (NQS domains: patient safety; clinical process/ effectiveness)
- Aggregate evidence quality: Grade C, based on systematic reviews and randomized controlled trials with a preponderance of harm over benefit
- Level of confidence in evidence: Low, due to lack of studies
- Benefits: Improved patient comfort, decreased pain after surgery, avoid additional risk of toxic shock syndrome, decreased patient anxiety, improved nasal airway, avoiding respiratory compromise, improved CPAP compliance among patients with OSA
- Risk, harm, cost: Risk of epistaxis
- Benefit-harm assessment: Preponderance of benefit over harm
- Value judgments: Perception by the GDG that nasal packing is frequently used after rhinoplasty despite no published evidence documenting benefits but significant evidence of potential harms; perception by the GDG that the use of nasal packing, in general, is declining among rhinoplasty surgeons and that, when packing is used, it is limited to 24 hours
- Intentional vagueness: The word "routinely" is used to avoid establishing a legal precedent and to allow clinicians discretion to identify patients who might benefit from nasal packing on an individualized basis
- Role of patient preferences: Moderate, the patient may have strong preferences about nasal packing that create an opportunity for shared decision making
- Exceptions: Patients with epistaxis that requires packing for control; patients with complex, unstable nasal fractures that require packing for stability; patients with a known bleeding/clotting disorder
- Policy level: Recommendation against
- Differences of opinion: None regarding the recommended action but some concern over whether a simple cotton ball or other temporary object in the nasal vestibule after nasal surgery could be misconstrued as packing

Statement 10: Outcome Assessment

Clinicians should document patient satisfaction with their nasal appearance and with their nasal function at a minimum of 12 months after rhinoplasty.

Recommendation based on observational studies, with a preponderance of benefit over harm.

Action Statement Profile

- Quality improvement opportunity: Incorporate patient-reported outcome measures in rhinoplasty surgery; empower the patient to express satisfaction and communicate with the clinician (NQS domains: patient and family engagement; clinical process/effectiveness)
- Aggregate evidence quality: Grade C, based on observational studies with a preponderance of benefit over harm.
- Level of confidence in evidence: Medium based on limited evidence concerning the optimal time frame to assess outcomes and the wide range of outcome measurements available
- Benefits: Empower the patient to communicate meaningful outcomes and express unmet expectations, provide feedback information on patient satisfaction to the surgeon, call explicit attention to the importance of assessing both cosmetic and function outcomes, identify patients who might benefit from additional counseling or management, identify causes of nasal obstruction unrelated to the original rhinoplasty that could be managed and corrected
- Risk, harm, cost: Time spent assessing outcomes, administrative burden of outcome measurements
- Benefit-harm assessment: Preponderance of benefit over harm
- Value judgments: The content experts in the GDG felt that 12 months was the minimal acceptable time for a reasonable stable outcome assessment of nasal appearance. While earlier assessment and documentation may be useful for counseling, the final assessment should ideally be done at ≥12 months
- Intentional vagueness: The method of assessing satisfaction is not specified and is at the discretion of the clinician; the precise timing of the final outcome assessment is not specified but should be no sooner than 12 months.
- Role of patient preferences: Small
- Exceptions: None
- Policy level: Recommendation
- Differences of opinion: None

Definitions

Aggregate Grades of Evidence by Question Type[a]

Grade	CEBM Level	Treatment	Harm	Diagnosis	Prognosis
A	1	Systematic review[b] of randomized trials	Systematic review[b] of randomized trials, nested case-control studies, or observational studies with dramatic effect	Systematic review[b] of cross-sectional studies with consistently applied reference standard and blinding	Systematic review[b] of inception cohort studies[c]
B	2	Randomized trials or observational studies with dramatic effects or highly consistent evidence	Randomized trials or observational studies with dramatic effects or highly consistent evidence	Cross-sectional studies with consistently applied reference standard and blinding	Inception cohort studies[c]
C	3-4	Nonrandomized or historically controlled studies, including case-control and observational studies	Nonrandomized controlled cohort or follow-up study (postmarketing surveillance) with sufficient numbers to rule out a common harm; case series, case-control, or historically controlled studies	Nonconsecutive studies, case-control studies, or studies with poor, nonindependent, or inconsistently applied reference standards	Cohort study, control arm of a randomized trial, case series, or case-control studies; poor-quality prognostic cohort study
D	5	Case reports, mechanism-based reasoning, or reasoning from first principles			
X	N/A	Exceptional situations where validating studies cannot be performed and there is a clear preponderance of benefit over harm			

CEBM, Oxford Centre for Evidence-Based Medicine; N/A, not applicable

[a]Adapted from Howick J, Chalmers I, Glasziou; the OCEBM Levels of Evidence Working Group. The Oxford 2011 levels of evidence: Oxford Centre for Evidence-Based Medicine. http://www.cebm.net/index.aspx?o=5653. Accessed October 22, 2015.

[b]A systematic review may be downgraded to level B because of study limitations, heterogeneity, or imprecision.

[c]A group of individuals identified for subsequent study at an early, uniform point in the course of the specified health condition or before the condition develops.

Guideline Definitions for Evidence-Based Statements

Strength	Definition	Implied Obligation
Strong recommendation	A strong recommendation means that the benefits of the recommended approach clearly exceed the harms (or that the harms clearly exceed the benefits, in the case of a strong negative recommendation) and that the quality of the supporting evidence is excellent (grade A or B).[a] In some clearly identified circumstances, strong recommendations may be made on the basis of lesser evidence, when high-quality evidence is impossible to obtain and the anticipated benefits strongly outweigh the harms.	Clinicians should follow a strong recommendation unless a clear and compelling rationale for an alternative approach is present.
Recommendation	A recommendation means that the benefits exceed the harms (or that the harms exceed the benefits, in the case of a negative recommendation) but that the quality of evidence is not as strong (grade B or C).[a] In some clearly identified circumstances, recommendations may be based on lesser evidence when high-quality evidence is impossible to obtain and the anticipated benefits outweigh the harms.	Clinicians should also generally follow a recommendation but should remain alert to new information and sensitive or patient preferences.
Option	An option means that either the quality of evidence is suspect (grade D) or that well-done studies (grade A, B, or C)[a] show little clear advantage to one approach versus another.	Clinicians should be flexible in their decision making regarding appropriate practice, although they may set bounds on alternatives. Patient preference should have a substantial influencing role.

[a]American Academy of Pediatrics classification scheme.

Clinical Algorithm(s)

An algorithm titled "Algorithm of the guideline's action statements" is provided in the original guideline document.

Scope

Disease/Condition(s)

Anatomical or functional abnormalities of the nose or nasal airway for which rhinoplasty procedures may be indicated

Guideline Category

Counseling

Evaluation

Management

Screening

Treatment

Clinical Specialty

Otolaryngology

Plastic Surgery

Sleep Medicine

Intended Users

Advanced Practice Nurses

Health Care Providers

Nurses

Physician Assistants

Physicians

Guideline Objective(s)

- To provide evidence-based recommendations for clinicians who either perform rhinoplasty or are involved in the care of a rhinoplasty candidate
- To optimize patient care, promote effective diagnosis and therapy, and reduce harmful or unnecessary variations in care

Target Population

All rhinoplasty patients aged ≥15 years

Note: Recommendations in this guideline concerning education and counseling to the patient are also intended to include the caregiver if the patient is <18 years of age.

Interventions and Practices Considered

1. Communicating with rhinoplasty candidates about their expectations for surgery and surgical outcomes
2. Assessing rhinoplasty candidates for comorbid conditions that could modify or contraindicate surgery
3. Evaluating the rhinoplasty candidate for nasal airway obstruction during the preoperative assessment
4. Preoperative education
5. Counseling for obstructive sleep apnea (OSA) patients
6. Managing postoperative pain and discomfort
7. Perioperative systemic steroids
8. Outcome assessment (nasal appearance and nasal function at a minimum of 12 months after rhinoplasty)

Note: The following were considered but not recommended: routine use of postoperative antibiotics for a duration >24 hours after surgery, post-rhinoplasty nasal packing.

Major Outcomes Considered

- Aesthetic and functional outcomes of rhinoplasty
- Impact of rhinoplasty on obstructive sleep apnea (OSA) (reduced continued positive airway pressure [CPAP], enhanced CPAP compliance, lower apnea hypopnea index)
- Postoperative complications of rhinoplasty, including pain, periorbital edema and ecchymosis
- Patient satisfaction
- Quality of life

Methodology

Methods Used to Collect/Select the Evidence

Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

Literature Search

An information specialist conducted 3 literature searches from May 2015 through December 2015, using a validated filter strategy, to identify clinical practice guidelines, systematic reviews, and randomized controlled trials. The search terms used were as follows:

> ((rhinoplasty OR rhinoplasties OR septorhinoplasty OR septorhinoplasties OR ((functional OR cosmetic) AND "nasal surgery" OR "nose surgery")))) (("nasal valve" AND airflow) OR "nasal valve repair" OR "nasal valve surgery") (((rhinoplasty OR rhinoplasties OR septorhinoplasty OR septorhinoplasties OR ((functional OR cosmetic) AND "nasal surgery" OR "nose surgery"))))) ((("nasal valve" AND airflow) OR "nasal valve repair" OR "nasal valve surgery")).

These search terms were used to capture all evidence on the population, incorporating all relevant treatments and outcomes.

The English-language searches were performed in multiple databases: Health Services/Technology Assessment Texts (HSTAT), Agency for Healthcare Research and Quality (AHRQ), BIOSIS Previews, CAB Abstracts, Allied and Complementary Medicine Database (AMED), EMBASE, GIN International Guideline Library, Cochrane Library (Cochrane Database of Systematic Reviews, Database of Abstracts of Reviews of Effects [DARE], Health Technology Assessment [HTA] Database, National Health Service Economic Evaluation Database [NHS EED]), Australian National Health and Medical Research Council, New Zealand Guidelines Group, Scottish Intercollegiate Guidelines Network (SIGN), TRIP Database, National Institute for Health and Care Excellence (NICE) Evidence (includes NHS Evidence ENT & Audiology and National Library of Guidelines), Canadian Medical Association (CMA) Infobase, National Guideline Clearinghouse, PubMed Search, Web of Science, and the Cumulative Index to Nursing and Allied Health Literature.

The initial English-language search identified 21 clinical practice guidelines, 116 systematic reviews, and 171 randomized controlled trials published in 2005 or later. Systematic reviews were emphasized and included if they met quality criteria of (1) clear objective and methods, (2) an explicit search strategy, and (3) valid data extraction. Randomized controlled trials were included if they met quality criteria of (1) randomization, (2) double blinding, and (3) a clear description of participant withdrawals and dropouts. Additional evidence was identified, as needed, with targeted searches to support the guideline development group in writing sections of the guideline text.

After removing duplicates, irrelevant references, and non-English-language articles, 0 guidelines, 25 systematic reviews, and 48 randomized controlled trials were retained. In certain instances, targeted searches were performed by members of the guideline development group to address gaps from the systematic searches, identified in writing the guideline from November 2015 through July 2016. These additional searches yielded 1 additional clinical practice guideline and 4 additional systematic reviews.

Number of Source Documents

In total, the evidence supporting this guideline includes 1 guideline, 22 systematic reviews, and 19 randomized controlled trials.

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Aggregate Grades of Evidence by Question Type[a]

Grade	CEBM Level	Treatment	Harm	Diagnosis	Prognosis
A	1	Systematic review[b] of	Systematic review[b] of randomized trials, nested case-control studies, or	Systematic review[b] of cross-sectional studies	Systematic review[b] of inception cohort studies[c]

Grade	CEBM Level	Treatment	Harm	Diagnosis	Prognosis
		randomized trials	observational studies with dramatic effect	with consistently applied reference standard and blinding	
B	2	Randomized trials or observational studies with dramatic effects or highly consistent evidence	Randomized trials or observational studies with dramatic effects or highly consistent evidence	Cross-sectional studies with consistently applied reference standard and blinding	Inception cohort studies[c]
C	3-4	Nonrandomized or historically controlled studies, including case-control and observational studies	Nonrandomized controlled cohort or follow-up study (postmarketing surveillance) with sufficient numbers to rule out a common harm; case series, case-control, or historically controlled studies	Nonconsecutive studies, case-control studies, or studies with poor, nonindependent, or inconsistently applied reference standards	Cohort study, control arm of a randomized trial, case series, or case-control studies; poor-quality prognostic cohort study
D	5	Case reports, mechanism-based reasoning, or reasoning from first principles			
X	N/A	Exceptional situations where validating studies cannot be performed and there is a clear preponderance of benefit over harm			

CEBM, Oxford Centre for Evidence-Based Medicine; N/A, not applicable

[a]Adapted from Howick J, Chalmers I, Glasziou; the OCEBM Levels of Evidence Working Group. The Oxford 2011 levels of evidence: Oxford Centre for Evidence-Based Medicine. http://www.cebm.net/index.aspx?o=5653 . Accessed October 22, 2015.

[b]A systematic review may be downgraded to level B because of study limitations, heterogeneity, or imprecision.

[c]A group of individuals identified for subsequent study at an early, uniform point in the course of the specified health condition or before the condition develops.

Methods Used to Analyze the Evidence

Review of Published Meta-Analyses

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

The evidence-based approach to guideline development requires that the evidence supporting a policy be identified, appraised, and summarized and that an explicit link between evidence and statements be defined. Evidence-based statements reflect both the quality of evidence and the balance of benefit and harm that is anticipated when the statement is followed. The definitions for evidence-based statements are listed in the "Rating Scheme for the Strength of Evidence" and "Rating Scheme for the Strength of the Recommendations" fields.

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

This guideline was developed with an explicit and transparent a priori protocol for creating actionable statements based on supporting evidence and the associated balance of benefit and harm as outlined in the third edition of the "Clinical Practice Guideline Development Manual: A Quality-Driven Approach for Translating Evidence into Action" (see the "Availability of Companion Documents" field). The Guideline Development Group (GDG) consisted of 16 panel members representing experts in advanced practice nursing, plastic surgery, consumer advocacy, facial plastic and reconstructive surgery, otolaryngology, otology, psychiatry, plastic surgery, rhinology, and sleep medicine.

In a series of conference calls, the working group defined the scope and objectives of the proposed guideline. During the 16 months devoted to guideline development (ending in August 2016), the group met twice, with in-person meetings following the format previously described, and it

used electronic decision support software (BRIDGE-Wiz; Yale Center for Medical Informatics, New Haven, Connecticut) to facilitate creating actionable recommendations and evidence profiles. Internal electronic review and feedback on each guideline draft were used to ensure accuracy of content and consistency with standardized criteria for reporting clinical practice guidelines.

American Academy of Otolaryngology—Head and Neck Surgery Foundation (AAO-HNSF) staff used the Guideline Implementability Appraisal and Extractor to appraise adherence of the draft guideline to methodological standards, to improve clarity of recommendations, and to predict potential obstacles to implementation. Guideline panel members received summary appraisals in February 2016 and modified an advanced draft of the guideline.

Rating Scheme for the Strength of the Recommendations

Guideline Definitions for Evidence-Based Statements

Strength	Definition	Implied Obligation
Strong recommendation	A strong recommendation means that the benefits of the recommended approach clearly exceed the harms (or that the harms clearly exceed the benefits, in the case of a strong negative recommendation) and that the quality of the supporting evidence is excellent (grade A or B).[a] In some clearly identified circumstances, strong recommendations may be made on the basis of lesser evidence, when high-quality evidence is impossible to obtain and the anticipated benefits strongly outweigh the harms.	Clinicians should follow a strong recommendation unless a clear and compelling rationale for an alternative approach is present.
Recommendation	A recommendation means that the benefits exceed the harms (or that the harms exceed the benefits, in the case of a negative recommendation) but that the quality of evidence is not as strong (grade B or C).[a] In some clearly identified circumstances, recommendations may be based on lesser evidence when high-quality evidence is impossible to obtain and the anticipated benefits outweigh the harms.	Clinicians should also generally follow a recommendation but should remain alert to new information and sensitive or patient preferences.
Option	An option means that either the quality of evidence is suspect (grade D) or that well-done studies (grade A, B, or C)[a] show little clear advantage to one approach versus another.	Clinicians should be flexible in their decision making regarding appropriate practice, although they may set bounds on alternatives. Patient preference should have a substantial influencing role.

[a]American Academy of Pediatrics classification scheme.

Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

Method of Guideline Validation

External Peer Review

Internal Peer Review

Description of Method of Guideline Validation

The final guideline draft underwent extensive external peer review. Comments were compiled and reviewed by the panel's chair and co-chairs, and a modified version of the guideline was distributed and approved by the guideline development panel.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Improved peri- and postoperative strategies will maximize patient safety and optimize surgical results for patients. The recommendations facilitate shared decision making, promote realistic expectations, promote informed consent, identify unrealistic expectations, and improve quality of care and outcomes.

For additional benefits of specific interventions considered in the guideline, see the "Major Recommendations" field.

Potential Harms

- Potential harms of preoperative assessments in patients seeking rhinoplasty include patient anxiety, false-positive results from screening surveys, making the patient self-conscious, and adverse events of diagnostic procedures (endoscopy, imaging).
- A potential harm of not routinely prescribing antibiotic therapy for a duration of >24 hours after surgery is the possibility of infection.
- Systemic steroids may cause bone weakening, avascular necrosis of the femur, adverse effects on diabetes, and nervousness/anxiety, and may adversely impact wound healing.
- There is a risk of epistaxis by not packing the nasal cavity after rhinoplasty.

For additional possible harms of specific interventions considered in the guideline, see the "Major Recommendations" field.

Contraindications

Contraindications

- Clinicians should assess rhinoplasty candidates for comorbid conditions that could modify or contraindicate surgery, including obstructive sleep apnea, body dysmorphic disorder (BDD), bleeding disorders, or chronic use of topical vasoconstrictive intranasal drugs.
- BDD is a contraindication to elective rhinoplasty, and surgery should be strongly discouraged.
- If the nasal bones were broken, as occurs when osteotomy is performed in rhinoplasty, postoperative use of a continuous positive airway pressure (CPAP) mask that involves the nose (e.g., nasal mask, nasal pillows, full-face mask) may be contraindicated, as it may affect the healing process.

Qualifying Statements

Qualifying Statements

- The guideline is intended to focus on knowledge gaps, practice variations, and clinical concerns associated with this surgical procedure; it is not intended to be a comprehensive reference for improving nasal form and function after rhinoplasty.
- Guidelines are not intended to supersede professional judgment but, rather, may be viewed as a relative constraint on individual clinician discretion in a particular clinical circumstance. Less frequent variation in practice is expected for a "strong recommendation" than for a "recommendation." "Options" offer the most opportunity for practice variability. Clinicians should always act and decide in a way that they believe will best serve their patients' interests and needs, regardless of guideline recommendations. They must also operate within their scope of practice and according to their training. Guidelines represent the best judgment of a team of experienced clinicians and methodologists addressing the scientific evidence for a particular topic. Making recommendations about health practices involves value judgments on the desirability of various outcomes associated with management options. Values applied by the guideline panel sought to minimize harm and

diminish unnecessary and inappropriate therapy. A major goal of the panel was to be transparent and explicit about how values were applied and to document the process.

- The clinical practice guideline is not intended as the sole source of guidance in managing candidates for rhinoplasty. Rather, it is designed to assist clinicians by providing an evidence-based framework for decision-making strategies. The guideline is not intended to replace clinical judgment or establish a protocol for all individuals with this condition and may not provide the only appropriate approach to diagnosing and managing this program of care. As medical knowledge expands and technology advances, clinical indicators and guidelines are promoted as conditional and provisional proposals of what is recommended under specific conditions but are not absolute. Guidelines are not mandates. These do not and should not purport to be a legal standard of care. The responsible physician, in light of all circumstances presented by the individual patient, must determine the appropriate treatment. Adherence to these guidelines will not ensure successful patient outcomes in every situation. The American Academy of Otolaryngology—Head and Neck Surgery Foundation emphasizes that these clinical guidelines should not be deemed to include all proper treatment decisions or methods of care or to exclude other treatment decisions or methods of care reasonably directed to obtaining the same results.

Implementation of the Guideline

Description of Implementation Strategy

Implementation Considerations

The clinical practice guideline is published as a supplement to *Otolaryngology–Head and Neck Surgery*, which will facilitate reference and distribution. A full-text version of the guideline will be accessible, free of charge, at www.entnet.org. The guideline was presented to American Academy of Otolaryngology–Head and Neck Surgery (AAO-HNS) members as a miniseminar at the American Academy of Otolaryngology–Head and Neck Surgery Foundation (AAO-HNSF) 2016 Annual Meeting & OTO EXPO. Existing brochures and publications by the AAO-HNSF will be updated to reflect the guideline's recommendations.

As a supplement to clinicians, an algorithm of the guideline's action statements has been provided (see Figure 6 in the original guideline document). The algorithm allows for a more rapid understanding of the guideline's logic and the sequence of the action statements. The guideline development group hopes that the algorithm can be adopted as a quick reference guide to support the implementation of the guideline's recommendations.

Implementation Tools

Chart Documentation/Checklists/Forms

Clinical Algorithm

Foreign Language Translations

Patient Resources

Quick Reference Guides/Physician Guides

Resources

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

IOM Domain

Effectiveness

Patient-centeredness

Safety

Identifying Information and Availability

Bibliographic Source(s)

Ishii LE, Tollefson TT, Basura GJ, Rosenfeld RM, Abramson PJ, Chaiet SR, Davis KS, Doghramji K, Farrior EH, Finestone SA, Ishman SL, Murphy RX Jr, Park JG, Setzen M, Strike DJ, Walsh SA, Warner JP, Nnacheta LC. Clinical practice guideline: improving nasal form and function after rhinoplasty. Otolaryngol Head Neck Surg. 2017 Feb;156(2 Suppl):S1-S30. [125 references] PubMed

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2017 Feb

Guideline Developer(s)

American Academy of Otolaryngology - Head and Neck Surgery Foundation - Medical Specialty Society

Source(s) of Funding

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Guideline Committee

American Academy of Otolaryngology–Head and Neck Surgery Foundation (AAO-HNSF) Guideline Development Group

Composition of Group That Authored the Guideline

Guideline Development Group Members: Lisa E. Ishii, MD, MHS (*Chair*), Department of Otolaryngology–Head and Neck Surgery, Johns Hopkins University, Baltimore, Maryland, USA; Travis T. Tollefson, MD, MPH (*Assistant Chair*), University of California Davis Medical Center, Sacramento, California, USA; Gregory J. Basura, MD, PhD, University of Michigan Medical Center, Taubman Center, Ann Arbor, Michigan, USA; Richard M. Rosenfeld, MD, MPH (*Methodologist*), SUNY Downstate Medical Center, Brooklyn, New York, USA; Peter J. Abramson, MD, Ear-Nose-Throat of Georgia, Atlanta, Georgia, USA; Scott R. Chaiet, MD, MBA, The University of Tennessee Health Science Center, Memphis, Tennessee, USA; Kara S. Davis, MD, Department of Otolaryngology, University of Pittsburgh Medical Center, Pittsburgh, Pennsylvania, USA; Karl Doghramji, MD, Jefferson Sleep Disorder Center, Thomas Jefferson University, Philadelphia, Pennsylvania, USA; Edward H. Farrior, MD, Farrior Facial Plastic and Cosmetic Surgery, Tampa, Florida, USA; Sandra A. Finestone, PsyD, Consumers United for Evidence-Based Healthcare, Fredericton, Canada; Stacey L. Ishman, MD, MPH, Cincinnati Children's Hospital Medical Center, Cincinnati, Ohio, USA; Robert X. Murphy Jr, MD, MS, CPE, Lehigh Valley Health Network, Bethlehem, Pennsylvania, USA; John G. Park, MD, FCCP,

FAASM, Mayo Clinic Center for Sleep Medicine, Rochester, Minnesota, USA; Michael Setzen, MD, New York University School of Medicine, New York, New York, USA; Deborah J. Strike, Department of Otolaryngology–Head and Neck Surgery, University of Iowa Hospital and Clinics, Iowa City, Iowa, USA; Sandra A. Walsh, Consumers United for Evidence-Based Healthcare, Fredericton, Canada; Jeremy P. Warner, MD, Division Plastic and Reconstructive Surgery, Northshore University Health System, Northbrook, Illinois, USA; Lorraine C. Nnacheta, MPH, Department of Research and Quality, American Academy of Otolaryngology—Head and Neck Surgery Foundation, Alexandria, Virginia, USA

Financial Disclosures/Conflicts of Interest

Financial Disclosure and Conflicts of Interest

The cost of developing this guideline, including the travel expenses of all panel members, was covered in full by the American Academy of Otolaryngology—Head and Neck Surgery Foundation (AAO-HNSF). Potential conflicts of interest for all panel members in the past 2 years were compiled and distributed before the first conference call. After review and discussion of these disclosures, the panel concluded that individuals with potential conflicts could remain on the panel if they (1) reminded the panel of potential conflicts before any related discussion, (2) recused themselves from a related discussion if asked by the panel, and (3) agreed not to discuss any aspect of the guideline with industry before publication. Last, panelists were reminded that conflicts of interest extend beyond financial relationships and may include personal experiences, how a participant earns a living, and the participant's previously established "stake" in an issue.

Disclosures

Competing interests: Travis T. Tollefson—travel grant/lecture fee, AO North America. Peter J. Abramson—Georgia Society of Otolaryngology, leadership role and medical case reviewer for Carlock Copeland. Karl Doghramji—consulting fee for the following: UCB, Inc, Teva, Jazz, Vanda, Aptalis, Merck, Pfizer, Pernix; stock options with Merck. Robert X. Murphy Jr—intellectual disclosure: leadership role with American Society of Plastic Surgeons. John G. Park—research grant for sepsis research from Leading Biosciences. Michael Setzen—speakers' bureau honoraria for Meda; advisory board, Lannett (makers of topical cocaine) and Merck. Deborah J. Strike—consulting fee for Wolters Kluwer Health (course reviewer for e-learning course "cleft lip and palate"). Lorraine C. Nnacheta—salaried employee of the American Academy of Otolaryngology—Head and Neck Surgery Foundation.

Guideline Endorser(s)

American Academy of Facial Plastic and Reconstructive Surgery - Medical Specialty Society

American Academy of Pediatrics - Medical Specialty Society

American Rhinologic Society - Medical Specialty Society

American Society for Aesthetic Plastic Surgery, Inc. - Medical Specialty Society

American Society of Plastic Surgeons - Medical Specialty Society

Society of Otorhinolaryngology and Head and Neck Nurses - Medical Specialty Society

The Rhinoplasty Society - Nonprofit Organization

Guideline Status

This is the current release of the guideline.

This guideline meets NGC's 2013 (revised) inclusion criteria.

Guideline Availability

Available from the SAGE Journals Web site .

Availability of Companion Documents

The following are available:

- Ishii LE, Tollefson TT, Basura GJ, Rosenfeld RM, Abramson PJ, Chaiet SR, Davis KS, Doghramji K, Farrior EH, Finestone SA, Ishman SL, Murphy RX Jr, Park JG, Setzen M, Strike DJ, Walsh SA, Warner JP, Nnacheta LC. Clinical practice guideline: improving nasal form and function after rhinoplasty executive summary. Otolaryngol Head Neck Surg. 2017 Feb;156(2):205-19. Available from the SAGE Journals Web site .
- OTO: Improving nasal form and function after rhinoplasty: clinical practice guideline. Podcast part 1 and 2. Alexandria (VA): American Academy of Otolaryngology–Head and Neck Surgery Foundation (AAO-HNSF). 2017 Feb. Available from the American Academy of Otolaryngology–Head and Neck Surgery Foundation (AAO-HNSF) Web site .
- Rosenfeld RM, Shiffman RN, Robertson P. Clinical practice guideline development manual, third edition: a quality-driven approach for translating evidence into action. Otolaryngol Head Neck Surg. 2013;148(1):S1-S55. Available from the SAGE Journals Web site .

Additional physician resources, including forms and questionnaires, are also available from the AAO-HNSF Web site .

Patient Resources

The following is available:

- Ishii L, O'Connor S, Strike DJ, Walsh SA. Plain language summary: improving nasal form and function after rhinoplasty. Otolaryngol Head Neck Surg. 2017 Feb;156(2):220–7. Available from the SAGE Journals Web site .

Patient handouts with frequently asked questions are available in English and Spanish from the American Academy of Otolaryngology–Head and Neck Surgery Foundation (AAO-HNSF) Web site .

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

NGC Status

This NGC summary was completed by ECRI on June 12, 2017. The information was verified by the guideline developer on July 6, 2017.

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